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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/768,976	01/30/2004	Keith V. Wood	341.020US1	6271

21186 7590 09/09/2005

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EXAMINER	
KOSSON, ROSANNE	

ART UNIT	PAPER NUMBER
1653	

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/768,976	WOOD ET AL.	
	Examiner	Art Unit	
	Rosanne Kosson	1653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-109* is/are pending in the application.

4a) Of the above claim(s) *12-14 and 16-106* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,15 and 107-109* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/9 & 12/28/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *PTO-1449 of 3/9/05*.

Sdd

DETAILED ACTION

Election/Restrictions

Applicants' election with traverse of Group I, claims 1-12, 15 and 107-109 in the reply filed on August 8, 2005 is acknowledged. Applicants' election of the species of biotin as the functional group (claim 10) and chromophore as a property of the elected functional group (claim 15) is acknowledged.

Claims 13, 14 and 16-106 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to nonelected inventions, there being no allowable generic or linking claim. Claim 12 is withdrawn from prosecution because it does not read on the elected invention. Biotin is a chromophore, but it is not a fluorophore.

Accordingly, claims 1-11, 15 and 107-109 are examined on the merits herewith.

Regarding Applicants' traversal of the restriction requirement, all of Applicants' arguments have been considered, but they are not persuasive of error. Applicants assert that all the groups should be examined because they are closely related. But the recited feature that relates them is a hydrolase substrate with at least one functional group. Such a feature is so broad, and reads on such a vast number of molecules that this feature does not serve to reduce the enormous burden of searching and considering the search results for each of the different groups. As outlined in the previous Office action, large number of products and methods are claimed. Consequently, the restriction requirement is maintained and made final.

Allowable Subject Matter

To the extent that claim 9 reads on biotin as the R group (functional group), claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Additionally, to be allowable, R would also have to be amended to biotin, the species elected in claim 10.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-11, 15 and 107-109 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, these claims recite a compound that comprises four genera of chemical moieties, three of which are unlimited (only halide is defined): the functional group R, a linker (L) that is any straight or branched chain comprising C, N, S or O, and A, which is any substrate for a dehalogenase, minus the halogen atom that is cleaved. To an organic chemist, a functional group is any reactive moiety in a molecule, such as –NO, -CN, -COOH, etc.

The specification lists examples of functional groups on p. 6, but these types of molecules are so different that they have no common structure or function. Thus, there are no common traits that delimit the term functional group. As a result, functional group reads on any molecule. The term linker reads on any protein, peptide, polysaccharide, lipid or organic polymer, such as polyethylene, polycarbonate, nylon, etc. The term A reads on any molecule with an alkyl group in which a halide may be substituted at one position. Further, claims 107 and 108 recite the moieties Y and Z, which are not defined. Claim 108 recites that Y is a portion of an ester group, but which portion? Claim 108 also recites that Z is an amine, any amine. But, in the examples in the specification, Z is an amino group that is terminal to a polyethylene glycol chain. The synthesized compounds have an amide group. Thus, R-Y and Z-L-A-X react to form compounds that contain R, a portion of Y, Z, L, A and X.

Although some species of the compound of claim 1 are disclosed in the specification (the compounds of formula I, formulas I and IV-XXVIII and Fig. 7), there is no evidence that a representative number of species of such a large and varied genus of compounds comprising R-L-A-X was in the possession of the inventors at the time of filing. There is no evidence that a representative number of species of such large and varied genera of compounds comprising R-Y and Z-L-A-X were in the possession of the inventors at the time of filing.

To satisfy the written description aspect of 35 U.S.C. 112, first paragraph, for a claimed genus, it must be clear that: (1) the identifying characteristics of the claimed genus have been disclosed, e.g., structure, physical and/or chemical characteristics,

functional characteristics when coupled with a known or disclosed correlation between function and structure, or a combination of these; and (2) a representative number of species within the genus must be disclosed. The specification does not disclose a representative number of species of R-L-A-X, R-Y or Z-L-A-X, with or without identifying characteristics. The specification discloses examples of polycyclic organic molecules as R, small multimers of polyethylene glycol as the linker and small straight chain saturated hydrocarbons as A. With respect to claims 107-109, methods of synthesizing the compounds of claim 1, because R, L, A, Y and Z are not adequately described, these claims do not properly describe what molecules must be reacted to produce the compounds of claim 1. Therefore, the claims, as written, fail to satisfy the written description requirement.

Claims 1-11, 15 and 107-109 are also rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method of synthesizing the compounds of formulas I and IV-XXVIII and Fig. 7, does not reasonably provide enablement for a method of synthesizing any compound of the formula R-L-A-X. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. As discussed above, because R, L, A, Y and Z are not defined, one of skill in the art would not know which compounds may be combined to yield R-L-A-X.

As a result, the scope of the instant claims is not commensurate with the enablement of the instant disclosure, because practice of the claimed invention would

require undue experimentation by an artisan of ordinary skill in the art to determine which molecules or portions of molecules corresponding to R, L, A, Y and Z may be reacted to produce the compounds of claim 1.

The factors to be considered in determining whether undue experimentation is required are summarized In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988). The court in Wands states: "Enablement is not precluded by the necessity for some experimentation such as routine screening. However, experimentation needed to practice the invention must not be undue experimentation. The key word is 'undue,' not 'experimentation.' " (Wands, 8 USPQ2d 1404). Clearly, enablement of a claimed invention cannot be predicated on the basis of quantity of experimentation required to make or use the invention. "Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations." (Wands, 8 USPQ2d 1404). The factors to be considered in determining whether undue experimentation is required include: (1) the quantity of experimentation necessary (immense, because Applicants assert that any compound of the formula R-L-A-X may be produced without naming R, L, A, Y or Z beyond the examples provided in the specification), (2) the amount of direction or guidance presented (specific guidance is presented for synthesizing the compounds of formulas IV-XXVIII only, although one of skill in the art would probably be able to synthesize the compounds of Fig. 7 as well), (3) the presence or absence of working examples (present for the synthesis of the compounds of formulas IV-XXVIII), (4) the nature of the invention (a compound comprising any functional group, any linker comprising a straight

or branched chain containing C, N, S, or O, any alkyl group, and a halide), (5) the state of the prior art (molecules that read on claim 1 are known, as described below), (6) the relative skill of those in the art (very high, that of highly trained research scientist), (7) the predictability or unpredictability of the art (see below), and (8) the breadth of the claims (broad, as discussed above).

With respect to the quantity of experimentation necessary, to demonstrate that a reaction of R-Y and Z-L-A-X can produce the compound R-L-A-X, many experiments would have to be conducted with many different molecules containing many different moieties that correspond to each of R, L, A, Y and Z. The appropriate reaction conditions (temperature, solvent, reactant ratios, time, atmosphere, pressure etc.) would also have to be determined. The results of the experiments would have to show that, in each case, R-L-A-X is synthesized and can be isolated.

Such experimentation is necessary because the specification describes only a very limited number of R groups, one type of linker group, a very limited number of A groups, an undefined Y group and one type of Z group. There is a large gap between Applicants' disclosure and the amount of information needed to formulate any compound of the formula R-L-A-X. One of skill in the art would have to experiment unduly to fill in this gap.

To be commensurate in scope with a broad claim for R-L-A-X, a great deal of guidance must be present in the specification to enable one of skill in the art to prepare a number of these compounds. As noted above, only a limited number of examples are disclosed.

Regarding predictability, each chemistry is one of the unpredictable arts, as each molecule has different physical and chemical properties and reacts differently. Therefore, one of skill in the art could not predict, given the examples in the specification, that any R, L, A, Y or Z group could be used to synthesize R-L-A-X according to the methods of claims 107-109.

Accordingly, claims 1-11, 15 and 107-109 fail to satisfy the enablement requirement.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

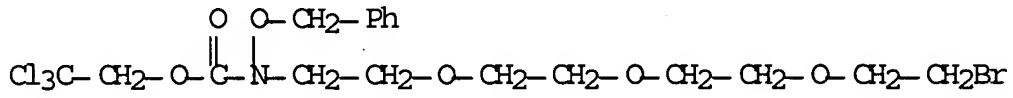
> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4, 5, 7, 11 and 15 rejected under 35 U.S.C. 102(e) as being anticipated by Barrett et al. (US 6,416,733). Barrett et al. disclose the compound N-benzyloxy carbonyl11-iodo-3,6,9-trioxaundecylamine: Ph-CH2-O-CO-NH-$(CH_2-CH_2-O)_3$-CH2-CH2-I (see col. 78, line 60, to col. 79, line 7). The molecule contains a halide group, 2 CH2 units and 3 ethylene glycol units. The

linker comprises between 3 and 30 atoms, and phenyl groups are chromophores. Therefore, a holding of anticipation is required.

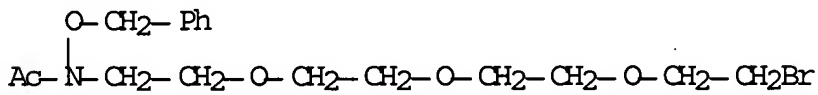
Claims 1, 3-5, 7, 11 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Akiyama et al., (J Chem Soc, Perkin Transactions 2: Physical Org Chem 9:1213-1218, 1989. Akiyama et al. disclose the compounds:

5,8,11-trioxa-2-azatridecanoic acid, 13-bromo-2-(phenylmethoxy)-2,2,2-trichloroethyl ester (CA index name)



and

acetamide, N-[2-[2-[2-(2-bromoethoxy)ethoxy]ethoxy]ethyl]-N-(phenylmethoxy) (CA INDEX NAME)

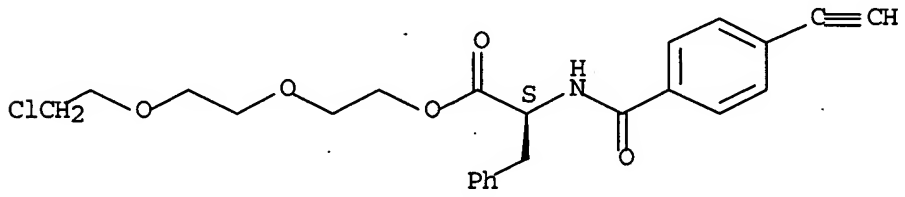


See p. 1213, compound nos. 3b, 3c, 4b and 4c.

The molecules contain a bromide group, 2 CH2 units and 2 or 3 ethylene glycol units (b or c, respectively). The linker comprises between 3 and 30 atoms, and phenyl groups are chromophores. Therefore, a holding of anticipation is required.

Claims 1, 3-5, 7, 10, 11 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Cheuk et al. (Polymeric Materials Science and Engineering 82:56-57, 2000). Cheuk et al. disclose the compound:

L-Phenylalanine, N-(4-ethynylbenzoyl)-, 2-[2-(2-chloroethoxy)ethoxy]ethyl ester (CA INDEX NAME)
Absolute stereochemistry. Rotation (+).



See p. 56, right col., compound no. 15.

The molecule contains a chloride group, 2 CH2 units and 2 ethylene glycol units. The linker comprises between 3 and 30 atoms, the functional group is an amino acid, and phenyl groups are chromophores. Therefore, a holding of anticipation is required.

The following is cited to show further the state of the art: Affholter (US 2002/0042055), which disclose mutant *Rhodococcus* dehalogenases and substrates for mutant *Rhodococcus* dehalogenases (see Figures 4, 5 and 6A and paragraphs 68, 69, 155 and 210).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosanne Kosson whose telephone number is 571-272-2923. The examiner can normally be reached on Monday-Friday, 8:30-6:00, with alternate Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon Weber, can be reached on 571-272-0925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rosanne Kosson
Examiner
Art Unit 1653

rk/2005-08-26